LV.—*On the real nature of the Minute Bodies in Flints, supposed to be Sponge Spiculæ.* By William C. Williamson.

To the Editors of the Annals of Natural History.

Gentlemen, Manchester, May 14th, 1846.

An exceedingly interesting example of friable chalk, found at Charing in Kent, having been placed in my hands by Dr. Mantell, I have been enabled by an examination of it under the microscope to correct an error into which I had fallen along with other observers, as to the real nature of those minute fusiform bodies, so common in chalk and chalk flints, and which have long been regarded as spiculæ of sponges.

On examining a section of flint, even when it does not contain the usual forms of *Xanthidia* and *Foraminifera*, there will generally be observed a number of small dark-coloured fusiform bodies, which have been regarded by geologists as sponge-spiculæ. The same things are frequent in the soft chalk of Cambridge and Kent, as well as at other localities.

A slight inspection of the Charing chalk, where the organisms are distinct and unmixed with amorphous matter, convinced me that the half of the small atoms of which the pulverulent mass was composed, consisted of bodies identical with those found in flint. Observing them to be calcareous and not siliceous, as I had expected, I was induced to make a more minute examination of them, and soon became convinced that they were *not* the calcareous spiculæ of sponges, but the separated prisms of disintegrated shell-structures, belonging to some genus of the group of *Margaritaceæ*, as defined by Dr. Carpenter in his valuable Report on the Microscopic Structure of Shells, published in the 'Report of the British Association' for 1844.

The first thing that struck me in the Charing specimens was their transverse lineation, a characteristic feature of shell-prisms, but one which I have never seen in sponge-spiculæ. Another point of difference was, that instead of being *round*, as is usually if not invariably the case with sponge-spiculæ, they were angular, having from four to six sides, which is also characteristic of shell-structures. The correctness of the view I had taken was soon settled by the discovery of a few specimens in which from two to half a dozen prisms remained in their original contact, exhibiting at one end the hexagonal reticulation so common in shell tissues, and at the other the pointed contour, which characterized the detached specimens. Even the latter portion presented a different appearance from what we see in sponge-spiculæ; instead of being thickest in the centre and gradually tapering away to each extremity, these organisms are nearly of equal thickness throughout a considerable portion of their length, and then taper off

somewhat suddenly, having frequently what engravers call a "diamond point" given to them by the introduction of a fresh plane at the apex. This peculiarity of contour had previously attracted my notice in the flint specimens. When the length of each prism has been less than the thickness of the lamina of shell of which it constituted a part, it is pointed at each extremity; but when this has not been the case, one end is truncate.

These facts lead to some interesting conclusions as to the part played by the larger mollusks in the accumulation of calcareous strata. In some recent deposits I have found, that in addition to calcareous *Foraminifera*, disintegrated shell-structures constituted an important part of the mass, by the decomposition of their animal textures and the separation of their prismatic portions. Dr. Carpenter has shown us in the case of the shell furnished to him by Mr. Stutchbury (see Report, *ut supra*, p. 5), that exposure to the action of water during a lengthened period is capable of decomposing the animal membrane and causing the calcareous prisms to separate. When we remember the small size of these prisms in many shells, as in some species of *Vulsella*, where Dr. Carpenter says they are only the $\frac{1}{2800}$th of an inch in diameter, we can readily conceive how, under favourable circumstances, they may add to the *organic* elements of limestone rocks, and yet be liable, from their small size and crystalline appearance, to be mistaken for inorganic atoms.

As this interesting subject is one to which I hope shortly to be able to recur, I will content myself for the present with directing the attention of microscopic geologists to it. Whether or not any real traces of sponge-spiculæ are to be found in the chalk, is a question about which I am as yet doubtful. I have not hitherto succeeded in meeting with one which I could without hesitation refer to that class of organisms. I may remark as an additional argument, that whilst I have observed these prisms to be abundant in some of the Cambridge chalk, where sponges are *comparatively* rare, I have not as yet seen them in those portions of the Yorkshire chalk, where shells are seldom met with, but where sponges (*Alcyonia* and *Ventriculites*) abound.

I remain, Sir, yours truly,

WILLIAM C. WILLIAMSON.

78 Bloomsbury, Manchester.

P.S. Since writing the above, Dr. Mantell has kindly supplied me with an interesting specimen of chalk, taken from the interior of a hollow flint, abounding with *Rotalia* and *Textilaria*, and also in the calcareous prisms. Along with these I succeeded in finding a very few well-marked calcareous triradiate sponge-spiculæ, as well as some small siliceous muricated forms. These however are entirely different from the prisms so common in ordinary flint.